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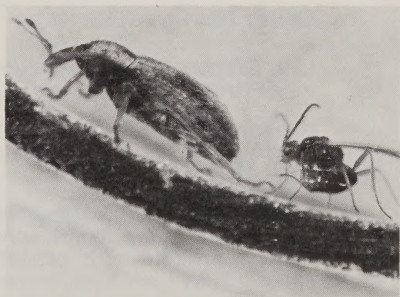
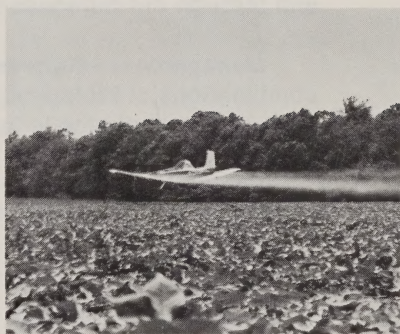
Animal and  
Plant Health  
Inspection  
Service

# Plant Protection and Quarantine

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# Plant Protection and Quarantine

One of the agencies in the U.S. Department of Agriculture is APHIS—the Animal and Plant Health Inspection Service. Within APHIS are two program units: Veterinary Services (APHIS-VS) and Plant Protection and Quarantine (APHIS-PPQ).

Many of the insects, weeds, nematodes, and plant diseases which attack U.S. crops are foreign invaders that entered before the advent of agricultural quarantine laws. Today, it is APHIS-PPQ's responsibility to administer these laws to help keep foreign pests out.

APHIS-PPQ protects America's agriculture through—

*Pest exclusion*—inspection of agricultural imports in the country of origin or at U.S. ports of entry;

*Survey and detection*—working with State officials and others to find new or exotic pest infestations early;

*Eradication*—where feasible, when potentially damaging pests slip through our defenses or enter through natural means;

*Management*—suppression or containment, through combinations of biological, cultural, and chemical means, when the most practical choice is to live with a pest; and

*Regulation*—establishing rules for interstate and international commerce that minimize the risk of pest introduction and spread.

## Cover Photographs

Left: Officers cut through confiscated fruit to look for destructive insects and diseases.

Upper right: Airplanes are used in some eradication programs for the most efficient and safe distribution of pesticides.

Lower right: When feasible, parasites and predators of insect pests are found, screened, and reared in large numbers for release in production areas. Beneficial parasites lay their eggs in the alfalfa weevil, the developing parasite killing the pest.

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## Pest Exclusion



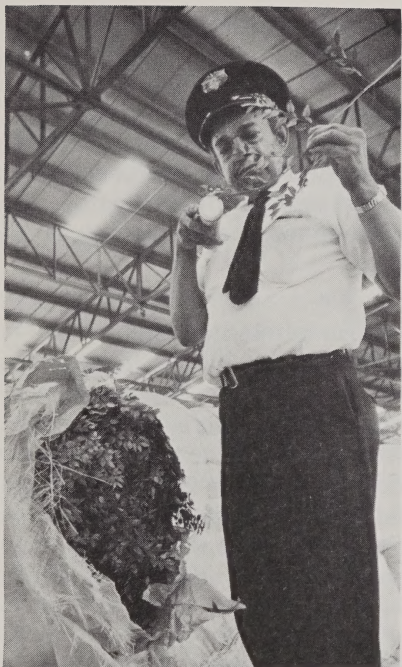
Agriculture officers work with U.S. Customs Service inspectors to check the baggage of all airline and seagoing passengers coming into the United States for agricultural products.

APHIS-PPQ officers at ports of entry inspect the baggage of incoming international travelers for prohibited plant material or other items that could carry pests or diseases. Over 300 million of these travelers arrive annually. They are frequently unaware that a single piece of fruit could carry fruit flies that would cost millions of dollars to eradicate if established here.

These APHIS officials also make sure that imported meat products and animal byproducts meet animal disease prevention entry requirements. These items could carry foreign animal diseases that would cost billions of dollars to eradicate. Organisms that cause African swine fever, for example, could enter in a single sausage. The dread foot-and-mouth disease virus can survive in soil and could be spread via dirt on travelers' shoes. For this reason, incoming travelers are asked if they visited a farm while overseas.

Foreign-origin garbage, including unused meals from aircraft, has major potential for spreading pests. From October 1, 1981, to October 1, 1982, nearly 49 million pounds of garbage were removed from incoming aircraft and destroyed. An additional 3 million pounds were removed from vessels.

Certain packages mailed internationally also undergo inspection, along with cargo, holds of ships, and airplane cabins. Baggage of travelers from Hawaii, Puerto Rico, Bermuda, and the U.S. Virgin



Commercial agricultural shipments are inspected to be sure they are free of insects and diseases.



Vehicle contents are checked at border stations to be sure only allowed products come into the United States.



Islands—which have pests not present on the Mainland—is cleared by APHIS-PPQ officers prior to departure.

Both personal baggage and commercial shipments are subject to import requirements. Most agricultural products are not prohibited and may enter—perhaps with some limitation, such as special treatments to destroy pests; some need permits or certificates; and some are indeed prohibited altogether, depending on the risk of pest spread from the country of origin.

Containerized cargo—increasingly in use in international commerce—presents special challenges and may have to be shipped under Customs bond from point of entry to destination, until it can be opened and inspected. When feasible, preclearance inspection and treatment arrangements are made to prevent backlogs at U.S. ports. Preclearance also helps ensure that foreign pests remain outside the United States. Such arrangements have been made with shippers of tulip and other flower bulbs in The Netherlands, Belgium, and France, and with fruit shippers in a number of countries.

APHIS-PPQ also works closely with the Department of Defense and Customs on military preclearance programs to reduce the possibility of exotic pests and diseases entering through movement of military personnel and equipment.

More rigid entry procedures apply to many living plants and certain animals. They must enter only through special facilities and may be required to be held in quarantine for up to 2 years. This is necessary because they can harbor diseases which cannot be detected by examination at the time of entry but which only become evident after many months.

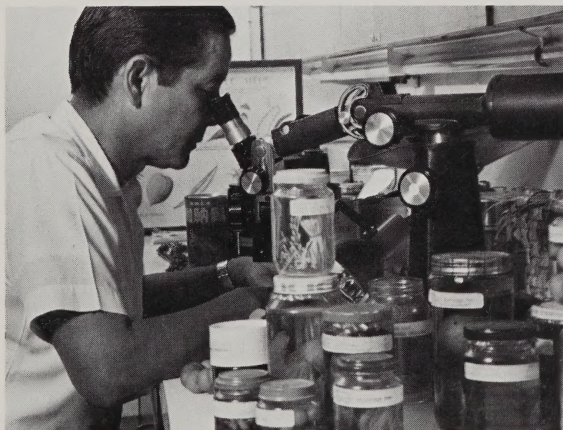
To help prevent pests from being carried on imports from the countries of origin, APHIS-PPQ—through its international program—assists nations which request help in establishing and modernizing their own plant pest control systems. APHIS-PPQ officers stationed at strategic locations in selected foreign countries work closely with their counterparts throughout the world. Close contact with counterparts in Canada and Mexico has been formalized through the North American Plant Protection Organization (NAPPO), which meets regularly to consider matters of mutual interest.



## Survey and Detection

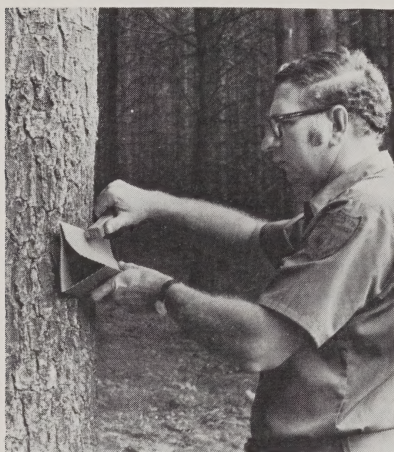
In a recent year, APHIS-PPQ inspectors made more than 24,000 significant pest finds in incoming international baggage, cargo, and carriers. In addition, they intercepted over 200,000 pounds of contraband meat and animal products which could carry foreign animal diseases. Still, due to the tremendous volume of goods involved, some pests do slip past and become established. Pests can also spread naturally across international boundaries. In either case, early detection is important.

At least 2 million hours a year are spent in surveying for plant pests in the United States, but until recently, most users of survey information had access to pest data from local areas only. To help take better advantage of these hours and ensure that new pests are reported quickly, APHIS-PPQ established and now coordinates the computer-assisted National Cooperative Plant Pest Survey and Detection Program (NCPSPDP). Under the program, States submit standardized data on pests and other factors relating to crop performance to a central computer; State summary printouts are available to each State, as well as to other States taking part. This allows States to be aware of regional pest problems and helps APHIS-PPQ find new pests early. Survey data—which may reflect the absence as well as the presence of pests—is also useful to APHIS-PPQ officers issuing phytosanitary certificates for U.S. exports, assuring foreign countries that our commodities are free of pests and diseases.



Insect and disease specimens collected in the field need proper identification before action can be taken.

APHIS-PPQ also conducts or coordinates specialized surveys in support of domestic pest programs, such as gypsy moth and golden nematode. The surveys provide for evaluation of the progress of domestic eradication or containment efforts. Various techniques may be used—soil sampling for golden nematode and pheromone (sex attractant) traps for gypsy moth, for example. Other surveys help ensure that any infestations of exotic fruit flies and other pests are found early enough for eradication.



Traps are set out in specific patterns to determine insect presence or population levels.

Sweep nets are used to detect the numbers of grasshoppers and other pests.







Giant tarpaulins seal a warehouse so that grain-eating khapra beetles can be eradicated with lethal gas.

Thanks to effective ongoing surveillance, newly introduced pests may be caught early enough to be eradicated. Mediterranean fruit fly in California, which took more than 2 years and almost \$100 million to eradicate from 1980 to 1982, is a well-known example, but there are others.

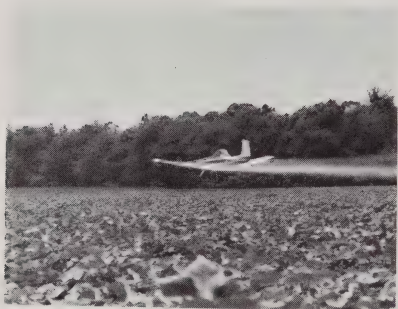
Khapra beetle—a tiny but destructive pest of stored grains—was eradicated from the United States in the 1950's but remains a serious threat, since much of the world remains heavily infested. Beetle larvae can lie dormant but viable for years in such articles as burlap bags commonly used in foreign shipments. In just 2 years—1980 and 1981—the beetle was detected in more than 20 different U.S. locations—including warehouses, spice factories, and a grocery store—and eradicated through chemical means.



Other pests sometimes invade—and are eradicated—in areas around ports. The giant African snail, which was originally brought in as a pet and subsequently escaped, was eradicated from the Miami, Fla., area after roughly 4 years and program costs of \$800,000 in the early 1970's. Another example—Oriental fruit fly—has invaded southern California several times and been eradicated using toxic food and sex lure baits.

The gypsy moth is firmly established in the Northeast and Mid-Atlantic States, but APHIS-PPQ helps other States eradicate isolated infestations caused by movement of the moth with such articles as household goods or in commerce. Eradication treatments—using chemical or biological means, alone or in combination with other methods—are followed by intensive trapping to ensure that all moths are gone.

Boll weevil was eradicated from Virginia and part of North Carolina in a 3 year trial program using pesticides, attractants, and cultural methods. While the weevil remains a pest through the rest of the Cotton Belt, the trial demonstrated that technology is available for eradication over a wider area.



Airplanes are used in some eradication programs for the most efficient and safe distribution of pesticides.



Biological means of eradicating pests such as the gypsy moth are always under development. They may include viruses, attractants, sterile insects, parasites, or predators.



New methods too are always under development to find more efficient ways to mass rear and release parasitic insect species in the field.

When eradication is not feasible—either because the pest has spread too far or because technology is not available—APHIS-PPQ then works to develop pest management schemes to help growers and others live with the pest.

These domestic programs follow predictable patterns—detection (first discovery); delimiting (finding extent of spread); regulation (to limit spread); and management (determining the best way to deal with the pest).

When the cereal leaf beetle entered the United States, pesticides failed to eradicate it and regulations didn't stop its spread. Researchers went to the beetle's native Europe, where they found tiny wasp parasites that control the beetle there. The scientists tested the parasites to make sure they wouldn't become pests themselves and then brought them to the United States. An APHIS-PPQ laboratory developed mass-rearing techniques and coordinated parasite releases over the infested area. Today, parasites control the beetle and it is only a minor pest.

Parasites originally released by APHIS-PPQ and cooperating States also control the citrus blackfly in Texas and Florida—far more cheaply and effectively than the chemicals formerly used for this purpose.

Growing out of these experiences with biological control—pitting one organism against another—is a newly established National Biological Control Center in Mission, Tex., with satellite facilities in other parts of the country. These laboratories coordinate biocontrol efforts against such pests as Mexican bean beetle, alfalfa weevil, and citrus whitefly.

While parasites alone can control a few pests, most require combinations of methods. Golden nematode—a pest of potatoes in parts of New York—is being controlled and its spread prevented through a combination of pesticides, resistant varieties, and strictly enforced regulations on movement of potatoes, soil, and other items that could spread it.

Witchweed—a parasitic plant that attacks corn and other crops—has been confined to a small area in the Carolinas through a regulatory program and equipment fumigations. The infested area has been reduced, principally through timely applications of herbicides. Pink bollworm has been kept out of cotton in California's San Joaquin Valley through release of irradiated sterile moths. When they mate with native moths, only infertile eggs are produced. There are many other examples, past and present.

Some native pests cause such severe and widespread damage that growers acting individually cannot control them. Grasshoppers, for example, can destroy livestock forage on millions of acres of western rangelands during outbreak years, causing additional massive damage on cropland. APHIS-PPQ helps keep damage down by cooperating with States and ranchers in aerial treatment programs on hard-hit rangeland.

Most domestic programs don't last indefinitely. Once a management scheme has been developed and implemented to the point where others can carry it on, APHIS-PPQ turns the program over to States and private industry and moves to new pest challenges.

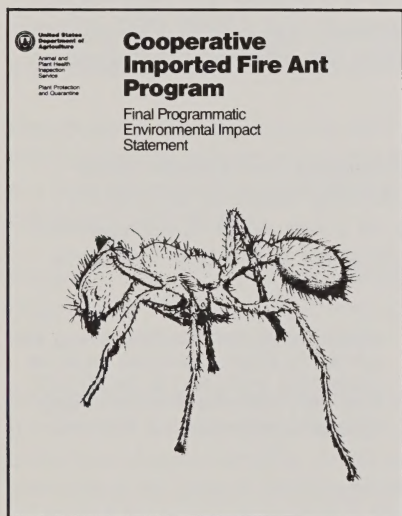


# Regulation

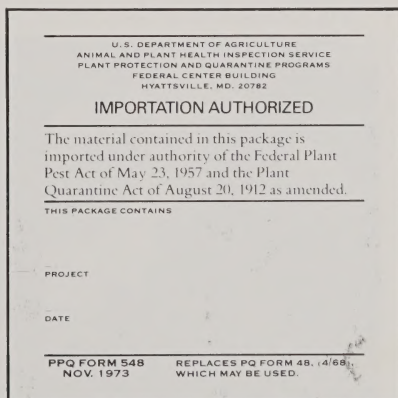
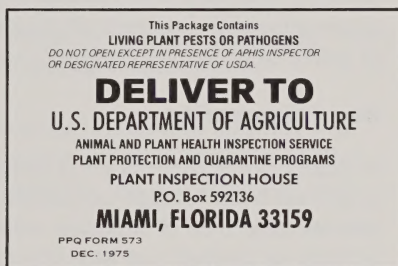
Preventing spread until a pest can be eradicated or management strategies developed is essential. Regulations on movement of articles that could serve to spread a pest are written to include specific articles and geographic areas, and are amended as needed.

Regulations are published in the Federal Register and generally are publicized through press releases and other means. When delays in implementing the regulations would result in pest entry or spread, emergency regulations are issued, with a provision for public comment. Often, public hearings are conducted to ensure that all interested parties have an opportunity to make their views known. In addition, written comments are always solicited and considered carefully in drawing up final, permanent regulations.

If, for any reason, regulations are no longer needed, they are withdrawn. These actions are also published in the Federal Register.



Permits, certificates, rules, and regulations are developed to manage and track economically important insect pests and diseases that may become widespread in the United States.





### Export Certification

Most other countries have plant protection services with import requirements similar to our own. To facilitate U.S. agricultural exports, APHIS-PPQ provides assurance that U.S. plants and plant products meet the plant quarantine import requirements of these countries. This assurance is in the form of a phytosanitary (plant health) certificate, issued by APHIS-PPQ or its State cooperators. Well over 100,000 of these certificates are issued annually. They are not required by APHIS-PPQ, but are issued as a service to exporters, upon request, as provided for under international agreements.

### Endangered Species Enforcement

APHIS-PPQ cooperates with the U.S. Department of the Interior in carrying out provisions of the Endangered Species Act that deal with import and export of endangered plant species. Special permits from the U.S. Department of the Interior are required for international movement of these species, and APHIS-PPQ officers at ports of entry are trained to identify the affected plant species.

### Seed Inspection

At many ports, APHIS-PPQ officers inspect and sample seed imported from foreign countries to ensure that it is accurately labeled and free of noxious weeds. At a few ports this inspection activity is carried out with the cooperation of the U.S. Customs Service.



Agricultural commodities being exported to other countries must be inspected and carry a certificate that they are free of insects and diseases before being shipped.

## **Staff Support**

Who are the people who keep U.S. crops safe from foreign pests and diseases?

On the front lines are APHIS-PPQ officers, technicians, and supervisors—trained in entomology, plant pathology, botany, nematology, weed science, and related disciplines.

National Program Planning and Emergency and International Program Staffs provide technical and managerial support to line personnel who carry out the programs.

Technology analysis and methods development specialists translate research results into operational programs. Biological control and equipment testing centers are at Mission, Tex., a gypsy moth methods laboratory is on Cape Cod, and others are at various locations around the country.

APHIS-PPQ pilots—also at Mission—man a number of specialized aircraft. They are involved in supervising pesticide application, releasing sterile insects, and other program support activities. They also develop, test, and evaluate new aircraft technology.

Computer modeling experts and analytical chemists monitor the environmental effects of programs to provide assurance that they are conducted so as to minimize effects on the environment and nontarget organisms.

Program officials work with Department lawyers, reviewing regulations to ensure that they accomplish their purpose but are not unnecessarily restrictive.

Budget, personnel, and related administrative and clerical support provide for smooth functioning of APHIS-PPQ's more visible activities. Accountability to the public requires structured provisions for public participation and access to agency records, managed by support people familiar with current regulations.

A public affairs staff ensures that those affected by or interested in programs are kept informed. It also works to enlist the aid of outside groups in furthering APHIS-PPQ's goals.

Together, these people work as a team to help protect U.S. agriculture and assure a plentiful food supply.





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Issued June 1983